

Objective: To factor quadratic trinomials
 in the form $ax^2 + bx + c$ (standard form)
 where $a=1$.

Steps:

- 1.) Find the factors of the first term (ax^2)
- 2.) Find the factors of the last term (c) constant.
- 3.) connect factors of the first terms to factors of the last term to see if they combine to equal middle term (bx).
 * Note: sometimes you might have different options of factors.
- 4.) write answer in factored form ($(\quad)(\quad)$).

Example 1: $x^2 + 10x + 16$

$$\begin{array}{c} x \cancel{\longrightarrow} 8 \\ x \cancel{\longrightarrow} 2 \\ 2x \quad 8x \\ \hline 10x \end{array}$$

$$\begin{aligned} a &= 1 \\ b &= 10 \\ c &= 16 \end{aligned}$$

$$(x+2)(x+8)$$

Example 2: $x^2 - 8x + 12$

$$\begin{array}{c} x \cancel{\longrightarrow} -6 \\ x \cancel{\longrightarrow} -2 \\ -2x \quad -6x \\ \hline -8x \end{array}$$

$$(x-2)(x-6)$$

* whenever middle term is negative and last term is positive, the factors of the last term are both negatives.

Example 3 :

$$x^2 + 4x - 21$$

$$\begin{array}{r} x \\ \times \end{array} \quad \begin{array}{r} 7 \\ \times \end{array}$$

$$\begin{array}{r} -3x \quad 7x \\ \hline 4x \end{array}$$

$$\boxed{(x-3)(x+7)}$$

* when middle term is positive and last term is negative choose bigger factor to be positive and smaller to be negative.

Example 4:

$$x^2 (-x) - 42$$

$$\begin{array}{r} x \\ \times \end{array} \quad \begin{array}{r} -7 \\ \times \end{array}$$

$$\begin{array}{r} 6x \quad -7x \\ \hline -x \end{array}$$

$$\boxed{(x+6)(x-7)}$$

* when both term are negative choose the bigger factor to be negative and the smaller to be positive.